

REMARKS

By this reply, claims 1, 7 and 8 have been amended without intending to narrow their scopes, and new claims 10 and 11 have been added, leaving claims 1-11 pending in the application. Claim 8 has been amended to provide strict antecedent basis. Support for new claims 10 and 11 is provided in claims 7 and 8, respectively. Favorable consideration of this application is respectfully requested in light of the following remarks.

Rejection Under 35 U.S.C. § 102

Claims 1, 3, 4 and 9 stand rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,905,618 to Matthews et al. ("Matthews"). The reasons for the rejection are stated on pages 2-4 of the Office Action. The rejection is respectfully traversed.

Claim 1, as amended, recites a method for forming a stepped profile from a layer sequence. In the recited method, a) in a first patterning step, a first layer partial sequence is removed apart from a first residual layer partial sequence, b) in a second patterning step, a second layer partial sequence located below the first layer partial sequence is partially removed by means of etching with a second etchant, c) in a third patterning step, a third layer partial sequence located below the second layer partial sequence is partially removed by means of etching with a third etchant, wherein: d) in the second patterning step, a region of the second layer partial sequence that is located below the first residual layer partial sequence is removed, by which a first projection of the first residual layer partial sequence being formed, and e) in the third patterning step, the first projection of the first residual layer partial sequence is removed. (Emphasis added).

As recited in claim 1, in the second patterning step, the first projection of the first residual layer partial sequence is removed, and in third patterning step, the first projection of the first residual layer partial sequence is removed. That is, the first projection is removed by performing the third patterning step.

Figures 1-4 depict an exemplary embodiment of the recited method. Figure 1 shows a starting structure including resist 3, first layer partial sequence 21, second layer partial sequence 22 located below the first layer partial sequence 21, and third layer partial sequence 23 located below second layer partial sequence 22. Figure 2 depicts the structure resulting from the first patterning step; Figure 3 depicts the structure resulting from the second patterning step; and Figure 4 depicts the structure resulting from the third patterning step. In the second patterning step, a region of the second layer partial sequence 22 that is located below the first residual layer partial sequence is removed, by which a first projection A of the first residual layer partial sequence is formed. See Figure 3. The first projection A advantageously acts as a chemical mask, which prevents a region of the second layer partial sequence that is located below the first projection from being dissolved by the third etchant, or at least substantially slows down such dissolution. See the description at page 6, lines 25-30, of the present specification. In the third patterning step, the first projection A of the first residual layer partial sequence is then removed. Removal of the first projection can be seen by comparing Figure 4, which shows the structure resulting from the third patterning step, to Figure 3, which shows the structure prior to the third patterning step. Matthews fails to disclose the method recited in claim 1.

Matthews discloses a method of making diffractive optical elements. The Office Action asserts that Matthews teaches a method for forming a stepped profile from a layer sequence in which, in a first patterning step, a first layer partial sequence 22 (i.e., etch stop layer 22) is removed apart from a first residual layer partial sequence 14 (i.e., phase shift layer 14) (FIG. 2B); in a second patterning step, a second layer partial sequence 24 (i.e., etch stop layer 24) located below the first layer partial sequence 22 is partially removed by means of etching with a second etchant (FIG. 3B); in a third patterning step, a third layer partial sequence 26 (i.e., etch stop layer 26) located below the second layer partial sequence 24 is partially removed by means of etching with a third etchant (FIGs. 3C and 4); wherein, in the second patterning step, a region of the second layer partial sequence 24 that is located below the first residual layer partial sequence 26 is removed, a first projection of the residual layer partial sequence 26 being formed, and in the third patterning step, the first projection of the first residual layer partial sequence is removed. The Office Action states that "the first projection of the first residual layer partial sequence was removed prior to the third patterning step" in Matthews' method.

Thus, the Office Action acknowledges that Matthews does not disclose removing "the projection of the first residual layer partial sequence" during the "third patterning step." The Office Action also asserts that the separate etch stop layers 22 and 26 of Matthews' structure correspond to the "first layer partial sequence" and the "first residual layer partial sequence," respectively, as recited in claim 1. The Office Action further asserts that the separate phase shift layer 14 and etch stop layer 26 correspond to the first residual layer partial sequence, as recited in claim 1.

As discussed above, the third patterning step recited in claim 1 (a) partially removes the second layer partial sequence and (b) removes the first projection of the first residual layer partial sequence. Compare Figures 3 (second patterning step) and 4 (third patterning step). Matthews does not disclose forming such "first projection" during the "second patterning step." The Office Action has identified no disclosure of forming such "first projection" in Matthews. Accordingly, because Matthews does not disclose forming the recited "first projection," Matthews further does not disclose removing such "first projection" during the "third patterning step." As Matthews does not disclose each and every feature recited in claim 1, claim 1 is not anticipated by Matthews.

Claims 3, 4 and 9, which depend from claim 1, are also not anticipated by Matthews for at least the same reasons as those for which claim 1 is not anticipated. Therefore, withdrawal of the rejection is respectfully requested.

Rejections Under 35 U.S.C. § 103

A. Claim 2 stands rejected under 35 U.S.C. § 103(a) over Matthews in view of U.S. Patent No. 6,297,161 to Sah ("Sah"). The reasons for the rejection are stated on pages 4-5 of the Office Action. The rejection is respectfully traversed.

Claim 2 depends from claim 1. Sah has been applied in the rejection for allegedly curing the deficiencies of Matthews with respect to the method recited in claim 1. Applicants respectfully submit that Sah fails to provide any suggestion or motivation to modify Matthews to result in the method recited in claim 1, including, *inter alia*, the features of d) in the second patterning step, a region of the second layer partial sequence that is located below the first residual layer partial sequence is

removed, by which a first projection of the first residual layer partial sequence being formed, and e) in the third patterning step, the first projection of the first residual layer partial sequence is removed. Therefore, withdrawal of the rejection is respectfully requested.

B. Claim 5 stands rejected under 35 U.S.C. § 103 over Matthews in view of U.S. Patent No. 6,156,662 to Ohori et al. ("Ohori"). The reasons for the rejection are stated on pages 5-6 of the Official Action. The rejection is respectfully traversed.

Claim 5 depends from claim 1. Ohori has been applied in the rejection for allegedly curing the deficiencies of Matthews with respect to the method recited in claim 1. Applicants respectfully submit that Ohori fails to provide any suggestion or motivation to modify Matthews to result in the method recited in claim 1, including, *inter alia*, the features of d) in the second patterning step, a region of the second layer partial sequence that is located below the first residual layer partial sequence is removed, by which a first projection of the first residual layer partial sequence being formed, and e) in the third patterning step, the first projection of the first residual layer partial sequence is removed. Therefore, withdrawal of the rejection of claim 5 is respectfully requested.

C. Claims 6 and 7 stand rejected under 35 U.S.C. § 103(a) over Matthews in view of U.S. Patent No. 3,663,184 to Wood et al. ("Wood"). The reasons for the rejection are stated on pages 6-8 of the Official Action. The rejection is respectfully traversed.

Claims 6 and 7 depend from claim 1. Wood has been applied for allegedly curing the deficiencies of Matthews with respect to the method recited in claim 1. Applicants respectfully submit that Wood fails to provide any suggestion or motivation to modify Matthews to result in the method recited in claim 1, including, *inter alia*, the features of d) in the second patterning step, a region of the second layer partial sequence that is located below the first residual layer partial sequence is removed, by which a first projection of the first residual layer partial sequence being formed, and e) in the third patterning step, the first projection of the first residual layer partial sequence is removed. Therefore, withdrawal of the rejection of claims 6 and 7 is respectfully requested.

D. Claim 8 stands rejected under 35 U.S.C. § 103(a) over Matthews in view of U.S. Patent No. 5, 160,492 to Wang et al. ("Wang"). The reasons for the rejection are stated on pages 8-10 of the Official Action. The rejection is respectfully traversed.

Claim 8 depends from claim 1. Wang has been applied for allegedly curing the deficiencies of Matthews with respect to the method recited in claim 1. Applicants respectfully submit that Wang fails to provide any suggestion or motivation to modify Matthews to result in the method recited in claim 1, including, *inter alia*, the features of d) in the second patterning step, a region of the second layer partial sequence that is located below the first residual layer partial sequence is removed, by which a first projection of the first residual layer partial sequence being formed, and e) in the third patterning step, the first projection of the first residual

layer partial sequence is removed. Therefore, withdrawal of the rejection of claim 8 is respectfully requested.

Conclusion

For the foregoing reasons, allowance of the application is respectfully requested. If there are any questions concerning this reply or the application in general, the Examiner is respectfully requested to contact the undersigned at the number given below.

Respectfully submitted,

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